

Remarks

Amendments to Claims 1 and 8

Applicant has amended independent Claims 1 and 8. Claim 1 is an apparatus claim claiming a microscope with a stand and a microscope stage disposed on the stand and capable of being moved in all three space directions (X, Y, and Z) by means of motors. Applicant has amended Claims 1 and 8 by replacing the limitation of "at least one temperature sensor" with "a plurality of temperature sensors." Support for these amendments can be seen in Figures 1, 2 and 6 showing three temperature sensors designated by reference no. 30. This is also discussed in paragraph 0015 of the specification discussing the structure of the microscope and in paragraph 0021 describing the correction of the XYZ drift of the microscope stage.

Claim 1 has also been amended to delete the limitation of recording drift values for the microscope stand 12 and replacing it with recording drift values for the microscope stage 18. Support for this amendment is found in paragraph 0015 of the specification stating, "...one microscope stage (18) adjustable in all three space directions." Additional support is found in paragraph 0018 describing the ΔX , ΔY , and ΔZ values correspond to the length to which microscope stage 18 had to be displaced.

Similarly, Claim 8 has been amended to include a recording and storing device having a correction table in which the a correction table holds drift values for the three spatial directions with that drift values based on temperature. Support for this amendment is found in paragraph 0018.

Applicant respectfully requests entry of these amendments into the record.

The § 103 Rejections of Claims 1-18

The Examiner rejected Claims 1-15, 17 and 18 under 35 U.S.C. § 103 (a) as obvious over U.S. Patent No. 6,801,650 to Kikuchi ("Kikuchi" or "the Kikuchi patent") in view of German Patent DE 19959228 to Stock ("Stock" or "Stock" patent"). Applicant has amended independent Claims 1 and 8. Applicant respectfully traverses the rejections of Claims 1 and 8 as amended and requests reconsideration.

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In *re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicant respectfully submits that the combined Kikuchi and Stock patents fail to establish a *prima facie* case of obviousness against Claims 1 and 8 as they fail to teach or suggest the use of a plurality of temperature sensors to move a microscope stage in all three of the X, Y, and Z directions. Kikuchi relies on only a single distance sensor mounted on the microscope objective to determine drift in a single direction, namely the Z direction. In correcting the microscope stage in the X and Y directions, the Kikuchi patent only discloses moving the microscope stage only to a preset X/Y position. There is no determination of drift based on temperature and subsequent correction in the X and Y directions caused by signals from the claimed correction table that would cause the adjustment of the two of the three claimed motors that move the stage in the X and/or Y direction. This is explicitly seen in col. 31, lines 33-39, stating, "By performing the auto-focusing using the objective lens for visible light 36, the distance between the objective lens or UV light 40 and the semiconductor wafer is of a 'certain known value.' The X-stage 14 and the Y-stage 15 then are driven to shift the distance sensor 41 to the above-mentioned pre-set position to detect the sensor output at this time (operating step 23). The "sensor output" of 'the known value' is found and the value so found is memorized as the third correction value C3." (Emphasis added.) Applicant respectfully points out that in the Kikuchi patent the correction values are corrections based deviations caused by different parameters, not deviations in the three spatial directions based on temperature alone. C1 is caused by deviations based on tilt of the inspection stage. (See Kikuchi col. 29, lines 51-53.) C2 is caused by deviations based on step difference in the die in the semiconductor wafer. (See Kikuchi, col. 30, lines 34-36.)

As noted by the Examiner, the Kikuchi patent fails to disclose the use of correction tables containing drift values to control microscope stage motors. The Examiner cites the Stock patent to teach the use of correction tables to control temperature drift. However, Applicant respectfully traverses the Examiner's statement that the abstract of the Stock patent teaches or suggests a correction table that contains drift values for the three space directions as claimed in Claims 1 and 8. First, the English language abstract only teaches that the laser scanning microscope in Stock has a single temperature sensor. This is similar, if not identical, to the Kikuchi patent. Taken together, the Kikuchi and Stock references thus teach the use of temperature measurement to correct drift only in the Z direction (considering the Z direction is the vertical distance between the objective lens and the microscope stage.) In this regard, Applicant respectfully points out that the Stock abstract only discloses correction of focus of the microscope objective, not the position of the microscope stage.

In contrast to the combined Kikuchi and Stock references, Claim 1 specifically includes a correction table that contains temperature drift values for three space directions (X, Y, and Z) and a regulating unit that controls three motors that each move the microscope stage in one of the three directions based on temperature drift. Similarly, method Claim 8 claims the method of correcting XYZ drift caused by temperature by utilizing a correction table containing drift values for the three spatial directions and operating all three microscope stage motors based on the temperatures sensors and the correction table to keep the stage in constant position relative to the optical axis of the microscope.

Thus, Applicant respectfully submits that taken as a whole, the combined Kikuchi and Stock patents fail to render Claims 1 and 8 obvious as they fail to teach or suggest either the microscope claimed by Claim 1 or the method claimed by Claim 8. Both Kikuchi and Stock teach the use of only one sensor to correct only focusing (Z direction) based on temperature. The Kikuchi patent only teaches the automatic return of the microscope stage to a preset X/Y position without reference to any measured temperature drift or use of a correction table, while the Stock abstract fails to teach any movement of the microscope stage in the X or Y direction at all, let

alone correction of that movement based on temperature. Applicant respectfully requests reconsideration and allowance of Claims 1 and 8.

“If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious.” *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Claims 2-7 depend from Claim 1 and Claims 9-15, 17, and 18 depend from Claim 8 and thus incorporate all the limitations of those respective claims. Because, as discussed above, the combined Kikuchi and Stock patents fail to render obvious Claims 1 and 8, they also fail to render obvious Claims 2-7 and 9-15, 17, and 18, respectively. Applicant respectfully requests the removal of the rejections of Claims 2-7 and 9-15 17, and 18 and allowance of those claims.

The Examiner rejected Claim 16 under 35 U.S.C. § 103 (a) as obvious over Kikuchi in view of Stock as applied to Claim 8 and further in view of U.S. Patent Application Publication No. 2002/0146628 to Ota (“Ota” or “the Ota reference”). Applicant respectfully traverses this rejection and requests reconsideration.

Claim 16 depends from Claim 8 and thus incorporates all the elements of that claim. The Examiner has applied the Kikuchi and Stock references to Claim 16 identically as in Claim 8. Thus, the Kikuchi and Stock patents fail to render Claim 16 obvious for the same reasons as for Claim 8, namely because they fail to teach or suggest the use of a plurality of temperature sensors and a correction table containing temperature drift values for all three spatial directions to maintain a constant position of a microscope stage in relation to the optical axis of a microscope. Although Ota discusses the use of statistical analysis to establish a correction table, Ota is concerned only with thermal expansion within a stationary substrate and contains no teaching of measuring the movement or drift of a microscope component based on temperature. Thus, like Kikuchi and Stock, Ota fails to teach or suggest the use of a plurality of sensors to measure temperature drift in all three spatial directions and also fails to provide for any component or method for moving that microscope stage in three directions to correct for temperature drift. Consequently, the combined Kikuchi, Stock, and Ota references fail to

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establish a *prima facie* case of obviousness against Claim 16. Applicant respectfully requests reconsideration and allowance of Claim 16.

Conclusion

Applicant respectfully submits that the present application is now in condition for allowance, which action is courteously requested. The Examiner is invited and encouraged to contact the undersigned attorney of record if such contact will facilitate an efficient examination and allowance of the application.

Respectfully yours,



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